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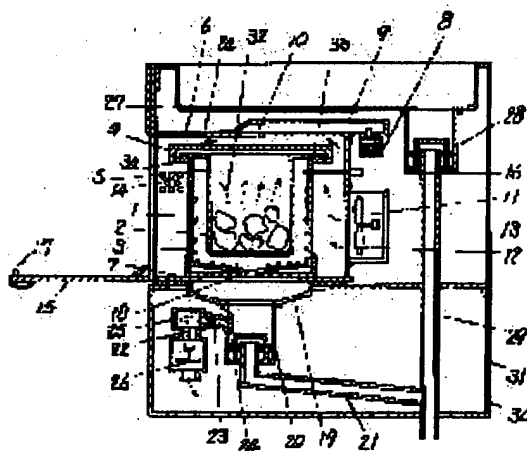
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(54) WASTE DISPOSAL DEVICE

(57)Abstract:

PURPOSE: To provide a waste disposal device capable of realizing clean and sanitary disposal by enhancing the condensing performance of water vapor generated from wastes by means of drying method using microwaves, and thereby reducing odor during drying.

CONSTITUTION: A condensing vessel 3, that is a condensing space, is provided in a disposal chamber 6, and a microwave introducing port 10 for introducing microwaves from a microwave oscillator 8, an air inlet port 13 for introducing air 12 from an air blower 11, an air outlet port 14 for discharging the air 12, and a disposal chamber door 15 are provided in the disposal chamber 6. Further, a condensed water discharging port 18 is provided at the lower part of the condensing vessel 3.



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TECHNICAL FIELD

[Industrial Application] Especially this invention relates to the wastes treatment equipment which processes wastes, such as a kitchen garbage, a papers contaminant, and a plastics contaminant, about a wastes treatment equipment.

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PRIOR ART

[Description of the Prior Art] In recent years, the processing technology of the waste discharged from a home or an industrial section attracts attention by making global environment problems into a background. There is an incineration formula processor using the mechanical processor called disposer, fuel gas, liquid fuel, etc. in a wastes treatment equipment from the former. It is the method which a mechanical processor grinds a kitchen garbage by the rotary knife, it is the method passed and processed in the sewerage, and an incineration formula processor burns fuel by the burner, and incinerates a kitchen garbage with the heat. Moreover, there is a wastes treatment equipment of the method which incinerates a kitchen garbage by the microwave other than these.

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EFFECT OF THE INVENTION

[Effect of the Invention] By explanation of the above example, according to the wastes treatment equipment of this invention, the following effects can be acquired so that clearly. While promoting dew condensation of the steam generated from waste by sending air into a processing room, and carrying out air cooling of the external surface of a condensation container where the processing interior of a room is made into positive pressure, it can avoid leaking the odor under dryness from a condensation container to the processing interior of a room. Moreover, since it can wash easily and condensation space is used as the condensation container 3 even if dirt adheres, since a condensation container and a waste stowage container can be taken out from a processing room, it also becomes possible to attain miniaturization as the whole equipment. a water-of-condensation outflow -- a solid content which plugging generates for the path of the sewerage from a hole can perform clean and sanitary processing, without having a bad influence on environment, in order not to discharge Moreover, since it is considering as dryness mode of processing by microwave, even if a plastics contaminant mixes, an exhaust gas property does not get worse.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, there is a technical problem as shown below in such a conventional wastes treatment equipment. Although a mechanical processor can grind a kitchen garbage finely, since it contains a lot of solid contents in drainage after pulverization processing, plugging occurs for the path of the sewerage and it is becoming a big social problem. An incineration formula processor has the fault that the whole equipment is complicated and becomes large-sized in order to use fuel gas, liquid fuel, etc. Although the wastes treatment equipment of the method which incinerates a kitchen garbage by microwave does not have the above-mentioned sewerage problem or the fault of it being complicated and becoming large-sized, to these, for the incineration method, it dews, after the moisture by which the exhaust gas property under processing was included in bad things (inadequate as home use) and bad exhaust gas discharging, and technical problems, such as polluting the outside of the interior of a room, are left behind. this invention solves such a technical problem, and while raising the condensation performance of the steam generated from waste paying attention to the dryness method by microwave, the odor under dryness is reduced, and it aims at offering the wastes treatment equipment which can perform clean and sanitary processing.

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MEANS

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the waste treatment equipment of this invention is characterized by providing the following. The waste stowage container which contains waste. The processing room which prepared the condensation container located in the outside of a waste stowage container in the interior. the microwave introduction which introduces the microwave from a microwave oscillator prepared in the processing room -- a hole the airstream ON into which the air from a blower fan is made to flow -- a hole and the air outflow into which air is made to flow -- the water-of-condensation outflow prepared in a hole, a processing room door, the air hole into which the steam generated from the waste prepared in the waste stowage container is made to flow, and the lower part of a condensation container -- a hole

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OPERATION

[Function] By the above-mentioned composition, the wastes treatment equipment of this invention dedicates a condensation container to the processing interior of a room, after feeding waste into the waste stowage container in a condensation container. if a microwave oscillator is operated after checking that the processing room door is closed -- microwave -- microwave introduction -- the processing interior of a room irradiates from a hole, and it is begun to heat the waste in a waste stowage container Especially to the moisture in waste, microwave is absorbed alternatively, generates a steam and dries waste. Moreover, a blower fan is also operated with a microwave oscillator and air is sent into a processing room from an air incurrent pore. the air outflow after air carries out air cooling of the external surface of a condensation container -- it dewes by the inside of a condensation container in most steams generated from waste by flowing out of a hole into the exterior of a processing room, and carrying out air cooling of the external surface of a condensation container - making -- the water of condensation -- carrying out -- a water-of-condensation outflow -- it discharges from a hole to the exterior of a condensation container While promoting dew condensation of the steam generated from waste by sending air into a processing room, and carrying out air cooling of the external surface of a condensation container where the processing interior of a room is made into positive pressure, the odor under dryness is made not to leak from a condensation container to the processing interior of a room. Moreover, since a condensation container and a waste stowage container can be taken out from a processing room, even if dirt adheres, it can wash easily.

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EXAMPLE

[Example] Hereafter, concrete explanation is performed using a drawing about the wastes treatment equipment of one example of this invention. In drawing 1, the waste stowage container 2 which contains waste 1 was located in the condensation container 3, and the waste input port lid 4 is formed in the condensation container 3. Although composition which made the lid of the condensation container 3 and the waste stowage container 2 serve a double purpose is covered with the waste input port lid 4, it is not necessary to make it dissociate as a lid, and it is good also as some of condensation containers 3 and waste stowage containers 2. Two or more air holes 5 are formed in the side of the waste stowage container 2. the hole of an air hole 5 -- the configuration and the place to prepare are arbitrary The condensation container 3 is formed by the microwave reflector, and has positioned the condensation container 3 and the waste stowage container 2 by each flange 3a and 2a. The waste input port lid 4 is formed by the heat-resistant outstanding microwave transparency material. Although the condensation container 3 is installed in the processing room 6 during dryness processing, the processing room 6 to the ejection of the condensation container 3 has become possible. Furthermore, the condensation container 3 is positioned to the processing room 6 with the rail 7 attached in the lower part of the processing room 6. the microwave introduction which introduces a microwave oscillator 8 and the microwave from a waveguide 9 into the processing room 6 -- the airstream ON into which a hole 10 and the air 12 from a blower fan 11 are made to flow -- a hole 13 and the air outflow into which air 12 is made to flow -- the hole 14, the processing room door 15, and the thermometric element 16 are formed microwave introduction -- the hole 10 is installed in the top center section of the processing room 6 since the inside of the processing room 6 is microwave space -- airstream ON -- a hole 13 and air defluxion -- the hole 14 is made into two or more stomata from which microwave does not leak to the exterior of the processing room 6 Sealing nature is raised so that microwave may not leak about the processing room door 15, either, and if it is not in the state which the processing room door 15 closed completely, the door opening-and-closing detector 17 will be installed so that a microwave oscillator 8 may not operate. The thermometric element 16 installed in the processing room 6 makes the condensation container 3 penetrate, and is locating the nose of cam in about five air hole so that the temperature of the steam generated from waste 1 during processing may be detected. the lower part of the condensation container 3 -- water-of-condensation defluxion -- a hole 18 -- preparing -- **** -- water-of-condensation defluxion -- the water-of-condensation container 19, the water-of-condensation trap 20, and the water-of-condensation eccrisis path 21 are established in the hole 18 bottom Moreover, the gas siphon 23 for making the water-of-condensation trap 20 attract the gas (for an odor to be included) 22 which occurs from waste 1 was connected, and deodorization equipment 25 and the inhalation-of-air fan 26 are formed in the downstream of the moisture collector 24 and the gas siphon 23 at the upstream of the gas siphon 23. You may form catalyst equipment, although deodorization equipment 25 was formed in this example. When installing under the sink, there are the drainage trap 28 and a drainage path 29 in the sink 27 bottom, and the water-of-condensation eccrisis path 21 is opened for free passage to the drainage path 29. It is divided by the outer wall 30 and equipment has formed the vent 31 in the outer wall 30.

[0007] Then, explanation about operation is performed. In drawing 1, after feeding waste 1 into the waste stowage container 2 in the condensation container 3, the waste input port lid 4 is closed and the condensation container 2 is dedicated in the processing room 6. if a microwave oscillator 8 is operated after checking that the processing room door 15 is closed -- microwave -- a waveguide 9 -- a passage -- microwave introduction -- it irradiates in the processing room 6 from a hole 10 When the processing room door 15 is not closed

completely, a microwave oscillator 8 operates with the door opening-and-closing detector 17. The microwave irradiated in the processing room 6 penetrates the waste input port lid 4 formed by microwave transparency material, and begins to heat the waste 1 in the waste stowage container 2. Especially to the moisture in waste 1, microwave is absorbed alternatively, a steam 32 is generated, and waste 1 is dried. Moreover, a blower fan 11 is also operated with a microwave oscillator 8, and air 12 is sent into the processing room 6 from the air incurrent pore 13. the air outflow after air 12 carries out air cooling of the external surface of the condensation container 3 -- it flows out of a hole 14 into the exterior of the processing room 6 by carrying out air cooling of the external surface of the condensation container 3, it dewes by the inside of the condensation container 3 in most steams 32 generated from waste 1 -- making -- the water of condensation 33 -- carrying out -- a water-of-condensation outflow -- it discharges from a hole 18 to the condensation container 3 down side a water-of-condensation outflow -- unlike the conventional mechanical processor, a solid content which plugging generates for the path of the sewerage from a hole 18 does not have a bad influence on environment in order not to discharge While promoting dew condensation of the steam 32 generated from waste 1 by sending air 12 into the processing room 6, and carrying out air cooling of the external surface of the condensation container 3 where the inside of the processing room 6 is made into positive pressure, it can avoid leaking the odor under dryness from the condensation container 3 in the processing room 6. Since the condensation container 3 and the waste stowage container 2 can be taken out from the processing room 6, even if dirt adheres, it can wash easily. Furthermore, miniaturization can be attained as the whole equipment by using condensation space as the condensation container 3.

[0008] moreover, the waste input port lid 4 -- microwave transparency material -- forming -- microwave introduction -- waste 1 can be made to absorb microwave efficiently by installing a hole 10 in the top center section of the processing room 6 By forming the condensation container 3 by the microwave reflector (metal), the intensity distribution of the microwave in the center section of the processing room 6 can be made dense. Since a metal can be used, it becomes easy [processing of the condensation container 3].

[0009] The water-of-condensation container 19, the water-of-condensation trap 20, and the water-of-condensation discharge path 21 are established in the hole 18 bottom. moreover, a water-of-condensation outflow -- The gas suction pipe 23 for making the water-of-condensation trap 20 attract the gas (for an odor to be included) 22 which occurs from waste 1 is connected. By considering as the composition which forms deodorization equipment 25 and the inhalation-of-air fan 26 in the downstream of the moisture collector 24 and the gas suction pipe 23 at the upstream of the gas suction pipe 23 After it passes the condensation aqueous machine 19, the water-of-condensation trap 20, the moisture collector 24, and the gas suction pipe 23 for the gas (an odor is included) 22 which occurs from waste 1 from the condensation container 3 and deodorization equipment 25 removes an odor, it discharges to the inhalation-of-air fan's 26 downstream. Although deodorization equipment 25 may not be needed for the method which dries waste 1, you may form catalyst equipment, when an odor is strong. It can avoid leaking gas (an odor being included) 22 from the condensation container 3 to the processing room 6 also by making the inside of the condensation container 3 into negative pressure. It becomes possible to raise seal nature of the direction which makes the inside of the condensation container 3 negative pressure. Furthermore, the flow of the gas (an odor is included) 22 which generates the inside of the processing room 6 from waste 1 by making the inside of positive pressure and the condensation container 3 into negative pressure can be made to equalize. The composition which makes the inside of the condensation container 3 negative pressure is effective for leak suppression of an odor also except the time of dryness processing.

[0010] Moreover, by installing a thermometric element 16 in the processing room 6, making the condensation container 3 penetrate and locating the nose of cam of a thermometric element 16 in about five air hole so that the temperature of the steam 32 generated from waste 1 during processing may be detected, where waste 1 is dried, microwave processing can be terminated. It becomes possible to detect elevation of front steam temperature at the time of a dryness end, and to terminate dryness by making it difficult to carry out a dryness end, and paying one's attention to the temperature of the steam 32 generated from waste 1, without igniting waste 1, when processing waste 1 with microwave, although the method made to incinerate was a center. In this example, in order to fix physical relationship of an air hole 5 and a thermometric element 16, the condensation container 3 and the waste stowage container 2 were positioned by each flange 3a and 2a, and the condensation container 3 is further positioned to the processing room 6 with the rail 7 attached in the lower

part of the processing room 6. Although the small crevice is prepared between the thermometric element 16 and the condensation container 3 in order to make ejection of the condensation container 3, and introduction easy, since the inside of the processing room 6 is made into positive pressure, the steam 32 in the condensation container 3 does not leak from this crevice to the processing room 6. Although the nose of cam of a thermometric element 16 is located in the outside of an air hole 5 in drawing 1 , you may make it located inside an air hole 5. As for the temperature rise of a steam 32, the direction located inside the air hole 5 becomes remarkable.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing of longitudinal section showing the composition of the wastes treatment equipment installed under the sink of one example of this invention

[Description of Notations]

- 1 Waste
- 2 Waste Stowage Container
- 3 Condensation Container
- 5 Air Hole
- 6 Processing Room
- 8 Microwave Oscillator
- 10 Microwave Introduction -- Hole
- 11 Blower Fan
- 12 Air
- 13 Air Incurrent Pore
- 14 Air Defluxion -- Hole
- 15 Processing Room Door
- 18 Water-of-Condensation Defluxion -- Hole
- 32 Steam

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] Especially this invention relates to the wastes treatment equipment which processes wastes, such as a kitchen garbage, a papers contaminant, and a plastics contaminant, about a wastes treatment equipment.

[0002]

[Description of the Prior Art] In recent years, the processing technology of the waste discharged from a home or an industrial section attracts attention by making global environment problems into a background. There is an incineration formula processor using the mechanical processor called disposer, fuel gas, liquid fuel, etc. in a wastes treatment equipment from the former. It is the method which a mechanical processor grinds a kitchen garbage by the rotary knife, it is the method passed and processed in the sewerage, and an incineration formula processor burns fuel by the burner, and incinerates a kitchen garbage with the heat. Moreover, there is a wastes treatment equipment of the method which incinerates a kitchen garbage by the microwave other than these.

[0003]

[Problem(s) to be Solved by the Invention] However, there is a technical problem as shown below in such a conventional wastes treatment equipment. Although a mechanical processor can grind a kitchen garbage finely, since it contains a lot of solid contents in drainage after trituration processing, plugging occurs for the path of the sewerage and it is becoming a big social problem. An incineration formula processor has the fault that the whole equipment is complicated and becomes large-sized in order to use fuel gas, liquid fuel, etc. Although the wastes treatment equipment of the method which incinerates a kitchen garbage by microwave does not have the above-mentioned sewerage problem or the fault of it being complicated and becoming large-sized, to these, for the incineration method, it dews, after the moisture by which the exhaust gas property under processing was included in bad things (inadequate as home use) and bad exhaust gas discharging, and technical problems, such as polluting the outside of the interior of a room, are left behind. this invention solves such a technical problem, and while raising the condensation performance of the steam generated from waste paying attention to the dryness method by microwave, the odor under dryness is reduced, and it aims at offering the wastes treatment equipment which can perform clean and sanitary processing.

[0004]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the wastes treatment equipment of this invention The processing room which prepared in the interior the waste stowage container which contains waste, and the condensation container located in the outside of a waste stowage container, the microwave introduction which introduces the microwave from a microwave oscillator prepared in the processing room -- with a hole the airstream ON into which the air from a blower fan is made to flow -- a hole and the air outflow into which air is made to flow -- the water-of-condensation outflow prepared in a hole, a processing room door, the air hole into which the steam generated from the waste prepared in the waste stowage container is made to flow, and the lower part of a condensation container -- it considers as the composition possessing the hole

[0005]

[Function] By the above-mentioned composition, the wastes treatment equipment of this invention dedicates a

condensation container to the processing interior of a room, after feeding waste into the waste stowage container in a condensation container. if a microwave oscillator is operated after checking that the processing room door is closed -- microwave -- microwave introduction -- the processing interior of a room irradiates from a hole, and it is begun to heat the waste in a waste stowage container Especially to the moisture in waste, microwave is absorbed alternatively, generates a steam and dries waste. Moreover, a blower fan is also operated with a microwave oscillator and air is sent into a processing room from an air incurrent pore. the air defluxion after air carries out air cooling of the superficies of a condensation container -- it dewes by the inside of a condensation container in most steams generated from waste by flowing out of a hole into the exterior of a processing room, and carrying out air cooling of the superficies of a condensation container -- making -- the water of condensation -- carrying out -- water-of-condensation defluxion -- it discharges from a hole to the exterior of a condensation container While promoting dew condensation of the steam generated from waste by sending air into a processing room, and carrying out air cooling of the superficies of a condensation container where the processing interior of a room is made into positive pressure, the odor under dryness is made not to leak from a condensation container to the processing interior of a room. Moreover, since a condensation container and a waste stowage container can be taken out from a processing room, even if dirt adheres, it can wash easily.

[0006]

[Example] Hereafter, concrete explanation is performed using a drawing about the wastes treatment equipment of one example of this invention. In drawing 1 , the waste stowage container 2 which contains waste 1 was located in the condensation container 3, and the waste input port lid 4 is formed in the condensation container 3. Although composition which made the lid of the condensation container 3 and the waste stowage container 2 serve a double purpose is covered with the waste input port lid 4, it is not necessary to make it dissociate as a lid, and it is good also as some of condensation containers 3 and waste stowage containers 2. Two or more air holes 5 are formed in the side of the waste stowage container 2. the hole of an air hole 5 -- the configuration and the place to prepare are arbitrary The condensation container 3 is formed by the microwave reflector, and has positioned the condensation container 3 and the waste stowage container 2 by each flange 3a and 2a. The waste input port lid 4 is formed by the heat-resistant outstanding microwave transparency material. Although the condensation container 3 is installed in the processing room 6 during dryness processing, the processing room 6 to the ejection of the condensation container 3 has become possible. Furthermore, the condensation container 3 is positioned to the processing room 6 with the rail 7 attached in the lower part of the processing room 6. the microwave introduction which introduces a microwave oscillator 8 and the microwave from a waveguide 9 into the processing room 6 -- the airstream ON into which a hole 10 and the air 12 from a blower fan 11 are made to flow -- a hole 13 and the air outflow into which air 12 is made to flow -- the hole 14, the processing room door 15, and the thermometric element 16 are formed microwave introduction -- the hole 10 is installed in the top center section of the processing room 6 since the inside of the processing room 6 is microwave space -- airstream ON -- a hole 13 and air defluxion -- the hole 14 is made into two or more stomata from which microwave does not leak to the exterior of the processing room 6 Sealing nature is raised so that microwave may not leak about the processing room door 15, either, and if it is not in the state which the processing room door 15 closed completely, the door opening-and-closing detector 17 will be installed so that a microwave oscillator 8 may not operate. The thermometric element 16 installed in the processing room 6 makes the condensation container 3 penetrate, and is locating the nose of cam in about five air hole so that the temperature of the steam generated from waste 1 during processing may be detected.

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CLAIMS

[Claim(s)]

[Claim 1] The wastes treatment equipment characterized by providing the following. The waste stowage container which contains waste. The processing room which prepared the condensation container located in the outside of the aforementioned waste stowage container in the interior. the microwave introduction which introduces the microwave from a microwave oscillator prepared in the aforementioned processing room -- a hole the airstream ON into which the air from a blower fan is made to flow -- a hole and the air outflow into which the aforementioned air is made to flow -- the water-of-condensation outflow prepared in a hole, a processing room door, the air hole into which the steam generated from the aforementioned waste prepared in the aforementioned waste stowage container is made to flow, and the lower part of the aforementioned condensation container -- a hole

[Claim 2] the upper part of a condensation container -- microwave transparency material -- forming -- microwave introduction -- the wastes treatment equipment according to claim 1 which installed the hole in the top center section of the processing room

[Claim 3] The wastes treatment equipment according to claim 1 which formed the side and the base of a condensation container by the microwave reflector.

[Claim 4] The wastes treatment equipment characterized by providing the following. The waste stowage container which contains waste. The processing room which prepared the condensation container located in the outside of the aforementioned waste stowage container in the interior. the microwave introduction which introduces the microwave from a microwave oscillator prepared in the aforementioned processing room -- a hole the airstream ON into which the air from a blower fan makes flow -- a hole and the air outflow into which the aforementioned air makes flow -- the water-of-condensation outflow which prepared in a hole, a processing room door, the air hole into which the steam generated from the aforementioned waste which prepared in the aforementioned waste stowage container makes flow, and the lower part of the aforementioned condensation container -- a hole and an aforementioned water-of-condensation outflow -- the inhalation-of-air fan who attracts the gas which occurs from the aforementioned waste from a part of water-of-condensation trap which prepared in the hole

[Claim 5] The wastes treatment equipment according to claim 4 which formed deodorization equipment or catalyst equipment in the path which makes gas attract.

[Claim 6] The wastes treatment equipment characterized by providing the following. The waste stowage container which contains waste. The processing room which prepared the condensation container located in the outside of the aforementioned waste stowage container in the interior. the microwave introduction which introduces the microwave from a microwave oscillator into the aforementioned processing room -- a hole the airstream ON into which the air from a blower fan make flow -- a hole and the air outflow into which aforementioned air make flow -- the water of condensation outflow prepared to a hole , a processing room door , the air hole into which the steam generated from the aforementioned waste which prepared in the aforementioned waste stowage container make flow , and the lower part of an aforementioned condensation container -- the thermometric element which detect the temperature of a hole and the steam which prepare in the aforementioned processing room and generate a nose of cam from the aforementioned waste which made penetrate the aforementioned

[Claim 7] The wastes treatment equipment according to claim 6 which established the positioning means between the condensation container and the processing room.

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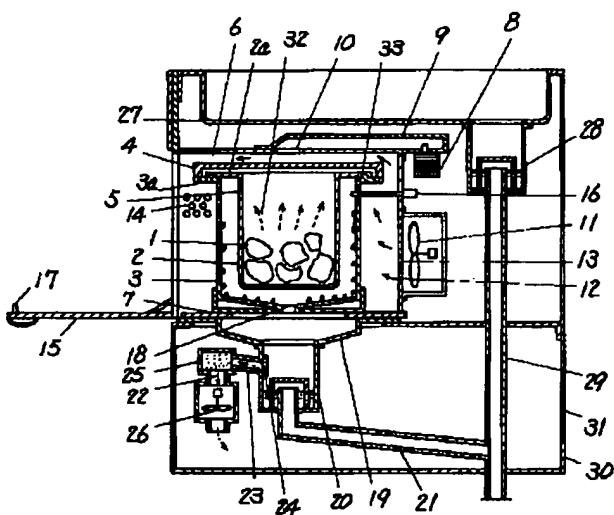
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DRAWINGS

[Drawing 1]

- | | |
|----|----------|
| 1 | 屍棄物 |
| 2 | 屍棄物収納容器 |
| 3 | 凝縮器 |
| 5 | 通気孔 |
| 6 | 処置室 |
| 8 | マイクロ波発振器 |
| 10 | マイクロ波導入孔 |
| 11 | 送風ファン |
| 12 | 空気 |
| 13 | 空気流入孔 |
| 14 | 空気流出孔 |
| 15 | 処置室扉 |
| 18 | 凝縮水流出孔 |
| 32 | 水蒸気 |



[Translation done.]

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(12)公開特許公報(A)

(11)特許出願公開番号

特開平5-24601

(43)公開日 平成5年(1993)2月2日

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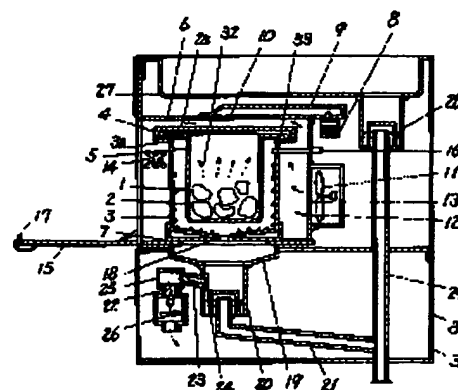
(54)【発明の名称】 廃棄物処理装置

(57)【要約】

【目的】 本発明は廃棄物処理装置に関するものであり、マイクロ波による乾燥方式により、廃棄物から発生する水蒸気の凝縮性能を高めるとともに、乾燥中の臭気を低減し、クリーンで衛生的な処理を実現できる廃棄物処理装置を提供することを目的とする。

【構成】 凝縮空間である凝縮容器3を処理室6内に設け、処理室6にマイクロ波発振器8からのマイクロ波を導入するマイクロ波導入孔10と、送風ファン11からの空気12を流入させる空気流入孔13と、空気12を流出させる空気流出孔14と、処理室扉15とを設け、凝縮容器3の下部に凝縮水流出孔18を設けた構成とする。

1 廃棄物
2 凝縮物収納容器
3 凝縮容器
5 空気孔
6 処理室
8 マイクロ波発振器
10 マイクロ波導入孔
11 送風ファン
12 空気
13 空気流入孔
14 空気流出孔
15 処理室扉
18 凝縮水流出孔
22 水受け



【特許請求の範囲】

【請求項1】 廃棄物を収納する廃棄物収納容器と、前記廃棄物収納容器の外側に位置する凝縮容器とを内部に設けた処理室と、前記処理室に設けたマイクロ波発振器からのマイクロ波を導入するマイクロ波導入孔と、送風ファンからの空気を流入させる空気流入孔と、前記空気を流出させる空気流出孔と、処理室扉と、前記廃棄物収納容器に設けた前記廃棄物から発生する水蒸気を流出させる通気孔と、前記凝縮容器の下部に設けた凝縮水流出孔とを具備した廃棄物処理装置。

【請求項2】 凝縮容器の上部をマイクロ波透過材で形成し、マイクロ波導入孔を処理室の上側中央部に設置した請求項1記載の廃棄物処理装置。

【請求項3】 凝縮容器の側面と底面をマイクロ波反射材で形成した請求項1記載の廃棄物処理装置。

【請求項4】 廃棄物を収納する廃棄物収納容器と、前記廃棄物収納容器の外側に位置する凝縮容器とを内部に設けた処理室と、前記処理室に設けたマイクロ波発振器からのマイクロ波を導入するマイクロ波導入孔と、送風ファンからの空気を流入させる空気流入孔と、前記空気を流出させる空気流出孔と、処理室扉と、前記廃棄物収納容器に設けた前記廃棄物から発生する水蒸気を流出させる通気孔と、前記凝縮容器の下部に設けた凝縮水流出孔と、前記凝縮水流出孔の下側に設けた凝縮水トラップと、前記凝縮水トラップの一部から前記廃棄物から発生するガスを吸引する吸気ファンを具備した廃棄物処理装置。

【請求項5】 ガスを吸引させる経路に脱臭装置、または触媒装置を設けた請求項4記載の廃棄物処理装置。

【請求項6】 廃棄物を収納する廃棄物収納容器と、前記廃棄物収納容器の外側に位置する凝縮容器とを内部に設けた処理室と、前記処理室にマイクロ波発振器からのマイクロ波を導入するマイクロ波導入孔と、送風ファンからの空気を流入させる空気流入孔と、前記空気を流出させる空気流出孔と、処理室扉と、前記廃棄物収納容器に設けた前記廃棄物から発生する水蒸気を流出させる通気孔と、前記凝縮容器の下部に設けた凝縮水流出孔と、前記処理室に設け、先端を前記凝縮容器を貫通させ前記通気孔近傍に位置させた前記廃棄物から発生する水蒸気の温度を検出する温度検出器を具備した廃棄物処理装置。

【請求項7】 凝縮容器と処理室の間に位置決め手段を設けた請求項6記載の廃棄物処理装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は廃棄物処理装置に関し、特に生ごみ、紙類ごみ、プラスチック類ごみなどの廃棄物を処理する廃棄物処理装置に関する。

【0002】

【従来の技術】 近年、地球環境問題を背景として、家庭

や産業部門から排出される廃棄物の処理技術が注目を集めている。廃棄物処理装置には従来から、ディスボージャーと呼ばれる機械式処理装置やガス燃料、液体燃料などを用いる焼却式処理装置がある。機械式処理装置は回転刃で生ごみを粉碎し、下水道に流して処理する方式であり、焼却式処理装置は燃料をバーナで燃焼し、その熱で生ごみを焼却する方式である。また、これらの他にも、マイクロ波によって生ごみを焼却する方式の廃棄物処理装置がある。

10 【0003】

【発明が解決しようとする課題】 しかしながら、このような従来の廃棄物処理装置には、以下に示すような課題がある。機械式処理装置は生ごみを細かく粉碎できるが、粉碎処理後の排水の中には多量の固形分を含んでいるため、下水道の経路に詰まりが発生し、大きな社会問題となってきた。焼却式処理装置はガス燃料、液体燃料などを用いるため、装置全体が複雑で大形になるという欠点を持つ。これらに対し、マイクロ波により、生ごみを焼却する方式の廃棄物処理装置は前述の下水道問題、あるいは複雑で大形になるという欠点はないが、焼却方式のため処理中の排気ガス特性が悪いこと（家庭用としては不十分）や排気ガスに含まれた水分が排出後に結露し、室内外を汚染することなどの課題が残されている。本発明はこのような課題を解決するもので、マイクロ波による乾燥方式に若目し、廃棄物から発生する水蒸気の凝縮性能を高めるとともに、乾燥中の臭気を低減し、クリーンで衛生的な処理を行なうことができる廃棄物処理装置を提供することを目的とする。

【0004】

30 【課題を解決するための手段】 上記課題を解決するため、本発明の廃棄物処理装置は、廃棄物を収納する廃棄物収納容器と、廃棄物収納容器の外側に位置する凝縮容器とを内部に設けた処理室と、処理室に設けたマイクロ波発振器からのマイクロ波を導入するマイクロ波導入孔と、送風ファンからの空気を流入させる空気流入孔と、空気を流出させる空気流出孔と、処理室扉と、廃棄物収納容器に設けた廃棄物から発生する水蒸気を流出させる通気孔と、凝縮容器の下部に設けた凝縮水流出孔とを具備した構成としたものである。

40 【0005】

【作用】 上記構成により、本発明の廃棄物処理装置は、廃棄物を凝縮容器内の廃棄物収納容器に投入した後、凝縮容器を処理室内に納める。処理室扉が閉じられているのを確認した後、マイクロ波発振器を作動させると、マイクロ波はマイクロ波導入孔から処理室内に照射され、廃棄物収納容器内の廃棄物を加熱し始める。特に廃棄物中の水分に対し、マイクロ波は選択的に吸収され、水蒸気を発生し廃棄物を乾燥していく。また、マイクロ波発振器とともに送風ファンも作動させ、空気を空気流入孔から処理室に送り込む。空気は凝縮容器の外表面を空冷し

た後、空気流出孔から処理室の外部に流出し、凝縮容器の外面を空冷することにより、廃棄物から発生した水蒸気の大半を凝縮容器の内面で結露させ凝縮水とし、凝縮水流出孔から凝縮容器の外部に排出する。空気を処理室に送り込み、処理室内を正圧にした状態で凝縮容器の外面を空冷することにより、廃棄物から発生した水蒸気の結露を促進するとともに、乾燥中の臭気を凝縮容器から処理室内にもれないようにしている。また、凝縮容器、廃棄物収納容器を処理室から取り出すことができるため、汚れが付着しても容易に洗浄できるようになっている。

【0006】

【実施例】以下、本発明の一実施例の廃棄物処理装置について図面を用いて具体的説明を行なう。図1において、廃棄物1を収納する廃棄物収納容器2を凝縮容器3内に位置させており、凝縮容器3には廃棄物投入口蓋4を設けている。廃棄物投入口蓋4は、凝縮容器3と廃棄物収納容器2の蓋を兼用した構成としているが、蓋として分離させる必要はなく、凝縮容器3、廃棄物収納容器2の一部としても良い。廃棄物収納容器2の側面には複数の通気孔5を設けている。通気孔5の孔形状や設ける場所は任意である。凝縮容器3はマイクロ波反射材で形成しており、凝縮容器3と廃棄物収納容器2は、それぞれのフランジ部3a、2aで位置決めしている。廃棄物投入口蓋4は耐熱性の優れたマイクロ波透過材で形成している。乾燥処理中には凝縮容器3は処理室6内に設置しているが、凝縮容器3は処理室6から取り出し可能になっている。さらに、凝縮容器3は処理室6の下部に取り付けたレール7により、処理室6に対し位置決めされている。処理室6にはマイクロ波発振器8、導波管9からのマイクロ波を導入するマイクロ波導入孔10と、送風ファン11からの空気12を流入させる空気流入孔13と、空気12を流出させる空気流出孔14と、処理室扉15と、温度検出器16を設けている。マイクロ波導入孔10は処理室6の上側中央部に設置している。処理室6内はマイクロ波空間であるため、空気流入孔13と空気流出孔14はマイクロ波が処理室6の外部にもれないような複数の小孔としている。処理室扉15についてもマイクロ波がもれないように密閉性を高めており、処理室扉15が完全に閉じた状態でないとマイクロ波発振器8が作動しないように扉開閉検出器17を設置している。処理室6に設置した温度検出器16は処理中に廃棄物1から発生する水蒸気の温度を検出するように、その先端を凝縮容器3を貫通させて通気孔5近傍に位置させている。凝縮容器3の下部には凝縮水流出孔18を設けており、凝縮水流出孔18の下側には凝縮水容器19、凝縮水トラップ20、凝縮水排出通路21を設けている。また、凝縮水トラップ20には廃棄物1から発生するガス（臭気を含む）22を吸引させるためのガス吸引管23を接続し、ガス吸引管23の上流側には水分捕集

器24、ガス吸引管23の下流側には脱臭装置25、吸気ファン26を設けている。本実施例では脱臭装置25を設けたが、触媒装置を設けても良い。流し台の下方に設置する場合、シンク27の下側には排水トラップ28、排水通路29があり、凝縮水排出通路21を排水通路29に連通している。装置は外壁30により仕切られており、外壁30には空気孔31を設けている。

【0007】続いて、動作についての説明を行なう。図1において、廃棄物1を凝縮容器3内の廃棄物収納容器2に投入した後、廃棄物投入口蓋4を閉じ、凝縮容器2を処理室6内に納める。処理室扉15が閉じられているのを確認した後、マイクロ波発振器8を作動させると、マイクロ波は導波管9を通り、マイクロ波導入孔10から処理室6内に照射される。処理室扉15が完全に閉じられていない場合には扉開閉検出器17によりマイクロ波発振器8が作動しないようになっている。処理室6内に照射されたマイクロ波はマイクロ波透過材で形成した廃棄物投入口蓋4を透過し、廃棄物収納容器2内の廃棄物1を加熱し始める。特に廃棄物1中の水分に対し、マイクロ波は選択的に吸収され、水蒸気32を発生し廃棄物1は乾燥していく。また、マイクロ波発振器8とともに送風ファン11も作動させ、空気12を空気流入孔13から処理室6に送り込む。空気12は凝縮容器3の外面を空冷した後、空気流出孔14から処理室6の外部に流出する。凝縮容器3の外面を空冷することにより、廃棄物1から発生した水蒸気32の大半を凝縮容器3の内面で結露させ凝縮水33とし、凝縮水流出孔18から凝縮容器3の下側に排出する。凝縮水流出孔18からは下水道の経路に詰まりが発生するような固形分は排出しないため、従来の機械式処理装置とは異なり、環境に悪影響を与えることがない。空気12を処理室6に送り込み、処理室6内を正圧にした状態で凝縮容器3の外面を空冷することにより、廃棄物1から発生した水蒸気32の結露を促進するとともに、乾燥中の臭気を凝縮容器3から処理室6内にもれないようにすることができる。凝縮容器3、廃棄物収納容器2を処理室6から取り出すことができるため、汚れが付着しても容易に洗浄できるようになっている。さらに、凝縮空間を凝縮容器3とすることにより、装置全体としてコンパクト化を図ることができる。

【0008】また、廃棄物投入口蓋4をマイクロ波透過材で形成し、マイクロ波導入孔10を処理室6の上側中央部に設置することにより、マイクロ波を効率良く廃棄物1に吸収させることができる。凝縮容器3をマイクロ波反射材（金属）で形成することにより、処理室6の中央部におけるマイクロ波の強度分布を密にすることができる。金属を使用することができるため、凝縮容器3の加工も容易となる。

【0009】また、凝縮水流出孔18の下側には凝縮水容器19、凝縮水トラップ20、凝縮水排出通路21を

設け、凝縮水トラップ20には廃棄物1から発生するガス(臭気を含む)22を吸引させるためのガス吸引管23を接続し、ガス吸引管23の上流側には水分捕集器24、ガス吸引管23の下流側には脱臭装置25、吸気ファン26を設ける構成とすることにより、廃棄物1から発生するガス(臭気を含む)22を凝縮容器3から凝縮水浴器19、凝縮水トラップ20、水分捕集器24、ガス吸引管23を通過させ、脱臭装置25で臭気を除去した後、吸気ファン26の下流側に排出する。廃棄物1を乾燥させる方式のため、脱臭装置25を必要としない場合もあるが、臭気強い場合には触媒装置を設けても良い。凝縮容器3内を負圧にすることによっても、ガス(臭気を含む)22を凝縮容器3から処理室6にもれないようにすることができる。凝縮容器3内を負圧にする方がシール性を向上させることが可能となる。さらに、処理室6内を正圧、凝縮容器3内を負圧にすることにより、廃棄物1から発生するガス(臭気を含む)22の流れを均一化させることができる。凝縮容器3内を負圧にする構成は乾燥処理時以外でも臭気のもれ抑制に効果的である。

【0010】また、処理中に廃棄物1から発生する水蒸気32の温度を検出するように温度検出器16を処理室6に設置し温度検出器16の先端を凝縮容器3を貫通させて通気孔5近傍に位置させることにより、廃棄物1を乾燥させた状態でマイクロ波処理を終了させることができる。廃棄物1をマイクロ波で処理する場合、廃棄物1を発火させることなく、乾燥終了させることは困難とされ、焼却させる方式が中心であったが、廃棄物1から発生する水蒸気32の温度に着目することにより、乾燥終了時の水蒸気温度の上昇を検出して乾燥を終了させることが可能となる。本実施例では通気孔5と温度検出器16の位置関係を一定にさせるために、凝縮容器3と廃棄物収納容器2は、それぞれのフランジ部3a、2aで位置決めし、さらに凝縮容器3は処理室6の下部に取り付けたレール7により処理室6に対し位置決めしている。凝縮容器3の取り出し、取り入れを容易にするため、温度検出器16と凝縮容器3の間に小さな隙間を設けているが、処理室6内を正圧にしているため、凝縮容器3内の水蒸気32がこの隙間から処理室6にもれるこ

とはない。図1では温度検出器16の先端を通気孔5の外側に位置させているが、通気孔5の内側に位置させても良い。通気孔5の内側に位置させた方が水蒸気32の温度上昇は顕著になる。

【0011】

【発明の効果】以上の実施例の説明で明らかなように、本発明の廃棄物処理装置によれば、次のような効果を得ることができる。空気を処理室に送り込み、処理室内を正圧にした状態で凝縮容器の外面を空冷することにより、廃棄物から発生した水蒸気の結露を促進するとともに、乾燥中の臭気を凝縮容器から処理室内にもれないようにすることができる。また、凝縮容器、廃棄物収納容器を処理室から取り出すことができるため、汚れが付着しても容易に洗浄でき、凝縮空間を凝縮容器3としているため、装置全体としてコンパクト化を図ることも可能となる。凝縮水流出孔からは下水道の経路に詰まりが発生するような固形分は排出しないため、環境に悪影響を与えることなく、クリーンで衛生的な処理を行なうことができる。また、マイクロ波による乾燥処理方式としているため、プラスチック類ごみが混入しても排気ガス特性は悪化しない。

【図面の簡単な説明】

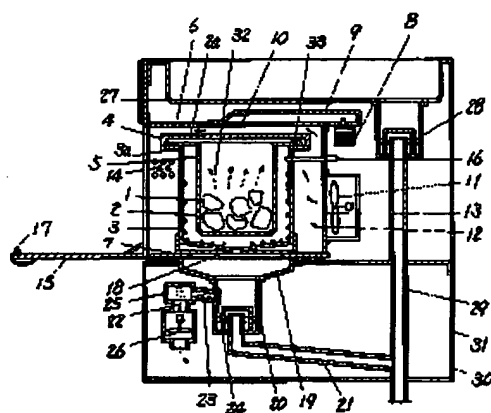
【図1】本発明の一実施例の流し台の下方に設置した廃棄物処理装置の構成を示す縦断面図

【符号の説明】

- 1 廃棄物
- 2 廃棄物収納容器
- 3 凝縮容器
- 5 通気孔
- 6 処理室
- 8 マイクロ波発振器
- 10 マイクロ波導入孔
- 11 送風ファン
- 12 空気
- 13 空気流入孔
- 14 空気流出孔
- 15 処理室扉
- 18 凝縮水流出孔
- 32 水蒸気

【図1】

- 1 扇形部
- 2 扇形部収納部
- 3 減圧部
- 5 送風孔
- 6 送風部
- 8 マイクロ液体導管
- 10 マイクロ液体導入孔
- 11 送風ファン
- 12 送風孔
- 13 送風導入孔
- 14 送風導出孔
- 15 送風部
- 16 減圧部
- 32 水膜部



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